

WEST[Generate Collection](#)[Print](#)**Search Results - Record(s) 1 through 10 of 29 returned.**☐ 1. Document ID: US 20020010096 A1

L19: Entry 1 of 29

File: PGPB

Jan 24, 2002

PGPUB-DOCUMENT-NUMBER: 20020010096

PGPUB-FILING-TYPE: new

DOCUMENT-IDENTIFIER: US 20020010096 A1

TITLE: Compositions and methods for protecting cultivated plants from herbicidal injury

PUBLICATION-DATE: January 24, 2002

INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY	RULE-47
Penner, Donald	Williamston	MI	US	
Sprague, Christy L.	Urbana	IL	US	
Burow, Richard F.	midland	MI	US	

US-CL-CURRENT: [504/118](#); [504/127](#), [504/128](#), [504/129](#), [504/130](#), [504/133](#), [504/134](#), [504/194](#)

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	RMC
Draw Desc	Image									

☐ 2. Document ID: US 20010056040 A1

L19: Entry 2 of 29

File: PGPB

Dec 27, 2001

PGPUB-DOCUMENT-NUMBER: 20010056040

PGPUB-FILING-TYPE: new

DOCUMENT-IDENTIFIER: US 20010056040 A1

TITLE: SELECTIVE HERBICIDES BASED ON ARYLSULPHONYLAMINO CARBONYLTRIAZOLINONES

PUBLICATION-DATE: December 27, 2001

INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY	RULE-47
DAHMEN, PETER	Neuss		DE	
FEUCHT, DIETER	MONHEIM		DE	
MULLER, KLAUS-HELMUT	DUSSELDORF		DE	
SANTEL, HANS-JOACHIM	LEVERKUSEN		DE	

US-CL-CURRENT: [504/128](#); [504/132](#), [504/134](#), [504/136](#), [504/137](#), [504/139](#)

Set Name Query

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result set

DB=USPT,PGPB,JPAB,EPAB,DWPI; PLUR=YES; OP=ADJ

<u>L19</u>	L17 not l13	29	<u>L19</u>
<u>L18</u>	L17 not l14	32	<u>L18</u>
<u>L17</u>	L12 and l15	32	<u>L17</u>
<u>L16</u>	L1 same l10	8	<u>L16</u>
<u>L15</u>	l1 and l10	1510	<u>L15</u>
<u>L14</u>	l11 not L13	25	<u>L14</u>
<u>L13</u>	l11 and L12	3	<u>L13</u>
<u>L12</u>	((504/128)!.CCLS.)	127	<u>L12</u>
<u>L11</u>	l9 and L10	28	<u>L11</u>
<u>L10</u>	glyphosate OR (roundup or spator or muster or glifonox or glycel) OR (phosphonomethylglycine or ((phosphonomethyl or (phosphono methyl)) glycine))	5978	<u>L10</u>
<u>L9</u>	tritosulfuron or l7	50	<u>L9</u>
<u>L8</u>	L7 not l6	1	<u>L8</u>
<u>L7</u>	L6 or (l2 near5 l4 near5 l1)	2	<u>L7</u>
<u>L6</u>	l2 adj5 l5	1	<u>L6</u>
<u>L5</u>	(l4 adj l3) or ((aminocarbonyl or (amino carbonyl)) adj2 l4 adj (benzenesulfonamide or benzenesulphonamide))	4	<u>L5</u>
<u>L4</u>	trifluoromethyl	72169	<u>L4</u>
<u>L3</u>	benzenesulfonylurea or benzenesulphonylurea or ((benzenesulfonyl or benzenesulphonyl) adj urea)	303	<u>L3</u>
<u>L2</u>	methoxy adj2 trifluoromethyl adj4 triazin\$2	38	<u>L2</u>
<u>L1</u>	sul\$2onylur\$6 or sul\$2onylcarbonyldi?mino or sul\$2onylaminocarbonylamino or (sul\$2onylaminocarbonyl amino) or (sul\$2onylamino (carbonylamino or (carbonyl amino))) or ur\$6sul\$2onyl\$ or carbonyldi?minosul\$2onyl\$ or aminocarbonylamino\$2onyl\$ or (aminocarbonyl aminosul\$2onyl\$) or (amino (carbonylamino\$2onyl\$ or (carbonyl aminosul\$2onyl\$))) or \$2carbamoysul\$2amoyl or (\$2carbamoyl \$2sul\$2amoyl) or sul\$2onyl near (urea\$1 or ureido or ureylene or uramino or carbonyldi?mino or aminocarbonylamino or (aminocarbonyl amino) or (amino (carbonylamino or (carbonyl amino))))	10530	<u>L1</u>

END OF SEARCH HISTORY

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments
Draw Desc	Image								

KMC

☐ 3. Document ID: US 6569809 B1

L19: Entry 3 of 29

File: USPT

May 27, 2003

US-PAT-NO: 6569809

DOCUMENT-IDENTIFIER: US 6569809 B1

TITLE: Package-mix agricultural chemical compositions having improved stability

DATE-ISSUED: May 27, 2003

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Sato; Tatsuo	Tokyo			JP
Kuchikata; Masus	Ibaraki			JP

US-CL-CURRENT: 504/127; 504/128, 504/362, 504/363, 514/938, 514/963

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments
Draw Desc	Image								

KMC

☐ 4. Document ID: US 6534444 B1

L19: Entry 4 of 29

File: USPT

Mar 18, 2003

US-PAT-NO: 6534444

DOCUMENT-IDENTIFIER: US 6534444 B1

TITLE: Herbicidal mixtures having a synergistic effect

DATE-ISSUED: March 18, 2003

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Sievernich; Bernd	Bohl-Iggelheim			DE
Landes; Max	Gonnheim			DE
Kibler; Elmar	Hassloch			DE
von Deyn; Wolfgang	Neustadt			DE
Walter; Helmut	Obrigheim			DE
Otten; Martina	Ludwigshafen			DE
Westphalen; Karl-Otto	Speyer			DE
Vantieghem; Herve	Stutensee			DE

US-CL-CURRENT: 504/128; 504/132, 504/134, 504/136, 504/137, 504/139

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments
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☐ 5. Document ID: US 6492301 B1

L19: Entry 5 of 29

File: USPT

Dec 10, 2002

US-PAT-NO: 6492301

DOCUMENT-IDENTIFIER: US 6492301 B1

TITLE: Herbicidal compositions with substituted phenylsulfonyleureas for controlling weeds in rice

DATE-ISSUED: December 10, 2002

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Hacker; Erwin	Hoccheim			DE
Bieringer; Hermann	Eppstein			DE

US-CL-CURRENT: 504/128; 504/132, 504/133, 504/134, 504/135

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	KMC
Draw Desc	Image									

☐ 6. Document ID: US 6436874 B1

L19: Entry 6 of 29

File: USPT

Aug 20, 2002

US-PAT-NO: 6436874

DOCUMENT-IDENTIFIER: US 6436874 B1

TITLE: Synergistic herbicidal agents based on leaf herbicides containing phosphorus, imidazolinones and hormone weed killers

DATE-ISSUED: August 20, 2002

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Kuah; Tai Choon	Kuala Lumpur			MY
Ooi; Soon Huat	Kuala Lumpur			MY
Jagdish Singh; Gill	Kuala Lumpur			MY
Anthonyamy; Daniel	Kuala Lumpur			MY

US-CL-CURRENT: 504/128

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	KMC
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☐ 7. Document ID: US 6362133 B1

L19: Entry 7 of 29

File: USPT

Mar 26, 2002

US-PAT-NO: 6362133

DOCUMENT-IDENTIFIER: US 6362133 B1

**** See image for Certificate of Correction ****

TITLE: Synergistically active herbicidal mixtures

DATE-ISSUED: March 26, 2002

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Landes; Max	Gonnheim			DE
Sievernich; Bernd	Bohl-Iggelheim			DE
Kibler; Elmar	Hassloch			DE
Nuyken; Wessel	Otterstadt			DE
Walter; Helmut	Obrigheim			DE
Westphalen; Karl-Otto	Speyer			DE
Mayer; Horst	Ludwigshafen			DE
Haden; Egon	Harthausen			DE
Mulder; Christiaan	Nelspruit			DE
Schonhammer; Alfons	Mertesheim			DE
Hamprecht; Gerhard	Weinheim			DE

US-CL-CURRENT: 504/128; 504/132, 504/133, 504/134, 504/136

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	KMIC
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☐ 8. Document ID: US 6316386 B1

L19: Entry 8 of 29

File: USPT

Nov 13, 2001

US-PAT-NO: 6316386

DOCUMENT-IDENTIFIER: US 6316386 B1

TITLE: Selective herbicides based on arylsulphonylaminocarbonyltriazolinones

DATE-ISSUED: November 13, 2001

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Dahmen; Peter	Leverkusen			DE
Feucht; Dieter	Monheim			DE
Muller; Klaus-Helmut	Dusseldorf			DE
Santel; Hans-Joachim	Leverkusen			DE

US-CL-CURRENT: 504/128; 504/132, 504/134, 504/136, 504/137, 504/139

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	KMIC
Draw Desc	Image									

☐ 9. Document ID: US 6235682 B1

L19: Entry 9 of 29

File: USPT

May 22, 2001

US-PAT-NO: 6235682

DOCUMENT-IDENTIFIER: US 6235682 B1

**** See image for Certificate of Correction ****

TITLE: Compositions and methods for protecting cultivated plants from herbicidal injury

DATE-ISSUED: May 22, 2001

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Penner; Donald	Williamston	MI		
Sprague; Christy L.	Urbana	IL		
Burow; Richard F.	Midland	MI		

US-CL-CURRENT: 504/118; 504/127, 504/128, 504/129, 504/130, 504/133, 504/134,
504/135, 504/138, 504/149, 504/194, 504/212, 504/213, 504/214, 504/247, 504/271,
504/304, 504/305, 504/326, 504/339, 504/340

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	KMC
Draw Desc	Image									

☐ 10. Document ID: US 6180563 B1

L19: Entry 10 of 29

File: USPT

Jan 30, 2001

US-PAT-NO: 6180563

DOCUMENT-IDENTIFIER: US 6180563 B1

TITLE: Herbicidal synergistic composition and method of weed control

DATE-ISSUED: January 30, 2001

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Ruegg; Willy	Gipf-Oberfrick			CH
Hudetz; Manfred	Rheinfelden			CH

US-CL-CURRENT: 504/128; 504/136

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	KMC
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L19: Entry 11 of 29

File: USPT

Dec 26, 2000

US-PAT-NO: 6165939

DOCUMENT-IDENTIFIER: US 6165939 A

TITLE: Concentrate herbicidal composition

DATE-ISSUED: December 26, 2000

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Agbaje; Henry E.	St. Louis	MO		
Brinker; Ronald J.	Ellisville	MO		
Carter; Deborah J.	Wildwood	MO		

US-CL-CURRENT: [504/105](#); [504/107](#), [504/128](#)

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments
Draw Desc	Image								

[KIMC](#)☐ 12. Document ID: US 6020288 A

L19: Entry 12 of 29

File: USPT

Feb 1, 2000

US-PAT-NO: 6020288

DOCUMENT-IDENTIFIER: US 6020288 A

TITLE: Methods and compositions for enhancing cytochrome P450 in plants

DATE-ISSUED: February 1, 2000

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Nonomura; Arthur M.	Boxborough	MA	01719	
Benson; Andrew A.	La Jolla	CA	92037	
Nishio; John N.	Laramie	WY	82070-3917	

US-CL-CURRENT: [504/127](#); [504/128](#), [504/130](#), [504/136](#), [504/138](#), [504/140](#), [504/142](#),
[504/143](#), [504/144](#), [504/149](#)

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments
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[KIMC](#)

☒ 13. Document ID: US 5990045 A

L19: Entry 13 of 29

File: USPT

Nov 23, 1999

US-PAT-NO: 5990045

DOCUMENT-IDENTIFIER: US 5990045 A

TITLE: Herbicidal mixtures

DATE-ISSUED: November 23, 1999

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Leep; Daniel Carl	Newark	DE		
Lichtner; Francis T.	Newark	DE		

US-CL-CURRENT: 504/128; 504/127, 504/133

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	KMIC
Draw Desc	Image									

☐ 14. Document ID: US 5990044 A

L19: Entry 14 of 29

File: USPT

Nov 23, 1999

US-PAT-NO: 5990044

DOCUMENT-IDENTIFIER: US 5990044 A

TITLE: Selective herbicides based on aryl uracils

DATE-ISSUED: November 23, 1999

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Santel; Hans-Joachim	Leverkusen			DE
Dollinger; Markus	Leverkusen			DE
Andree; Roland	Langenfeld			DE
Drewes; Mark Wilhelm	Langenfeld			DE

US-CL-CURRENT: 504/128; 504/132, 504/134, 504/136

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	KMIC
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☐ 15. Document ID: US 5968873 A

L19: Entry 15 of 29

File: USPT

Oct 19, 1999

US-PAT-NO: 5968873

DOCUMENT-IDENTIFIER: US 5968873 A

TITLE: Selective herbicides based on
4-amino-5-(1-methyl-ethyl)-2-(1,1-dimethylethylaminocarbonyl)-2,4-dihydr
o-3H-1,2,4-triazol-3-one

DATE-ISSUED: October 19, 1999

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Dahmen; Peter	Neuss			DE
Thielert; Wolfgang	Bury St. Edmunds			GB
Muller; Klaus-Helmut	Dusseldorf			DE
Riebel; Hans-Jochem	Wuppertal			DE

US-CL-CURRENT: 504/128; 504/129, 504/130, 504/132, 504/134, 504/136, 504/137,
504/139

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	KMC
Draw Desc	Image									

☒ 16. Document ID: US 5928995 A

L19: Entry 16 of 29

File: USPT

Jul 27, 1999

US-PAT-NO: 5928995

DOCUMENT-IDENTIFIER: US 5928995 A

TITLE: Herbicidal mixtures

DATE-ISSUED: July 27, 1999

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Lichtner, Jr.; Francis Thomas	Newark	DE		

US-CL-CURRENT: 504/128; 504/127, 504/133

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	KMC
Draw Desc	Image									

☐ 17. Document ID: US 5888935 A

L19: Entry 17 of 29

File: USPT

Mar 30, 1999

US-PAT-NO: 5888935

DOCUMENT-IDENTIFIER: US 5888935 A

**** See image for Certificate of Correction ****

TITLE: Synergistic herbicidal compositions of dimethenamid and glyphosate

DATE-ISSUED: March 30, 1999

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Fenderson; John M.	Kiowa	KS		
O'Neal; William B.	Buffalo Grove	IL		
Quaghebeur; Theo	Saint-Symphorien			BE
Schumm; Karl-Christoph	Campinas			BR
Van Loocke; Walter	Meetkerke			BE

US-CL-CURRENT: 504/128

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments
Draw Desc	Image								

KMIC

☐ 18. Document ID: US 5877114 A

L19: Entry 18 of 29

File: USPT

Mar 2, 1999

US-PAT-NO: 5877114

DOCUMENT-IDENTIFIER: US 5877114 A

TITLE: Potentiating herbicidal compositions of auxin transport inhibitors and glyphosate

DATE-ISSUED: March 2, 1999

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Anderson; Richard J.	Palo Alto	CA	94303	
Cloudsdale; Ian S.	Boulder Creek	CA	95006	
Lamoreaux; Robert J.	San Juan Batista	CA	94045	
Schaefer; Kristine	Adel	IA	50003	
Harr; Jost	CH-4104 Oberwil			CH

US-CL-CURRENT: 504/128; 504/127, 504/130, 504/138, 504/144

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments
Draw Desc	Image								

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☒ 19. Document ID: US 5872078 A

L19: Entry 19 of 29

File: USPT

Feb 16, 1999

US-PAT-NO: 5872078

DOCUMENT-IDENTIFIER: US 5872078 A

TITLE: Glyphosate formulations

DATE-ISSUED: February 16, 1999

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Kuchikata; Masuo	Ibaraki			JP
Prill; Erhard J.	Kirkwood	MO		
Richardson; Ronald O.	Ellisville	MO		
Sato; Tatsuo	Tokyo			JP
Surgant; John M.	Clayton	MO		
Wright; Daniel R.	St. Louis	MO		

US-CL-CURRENT: [504/206](#); [504/127](#), [504/128](#), [504/135](#), [504/137](#), [504/144](#), [504/146](#)

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	KMIC
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☐ 20. Document ID: US 5798317 A

L19: Entry 20 of 29

File: USPT

Aug 25, 1998

US-PAT-NO: 5798317

DOCUMENT-IDENTIFIER: US 5798317 A

TITLE: Herbicidal mixtures comprising anilofos and other herbicides

DATE-ISSUED: August 25, 1998

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Pappas-Fader; Thalia	Landenberg	PA		
Leep; Daniel Carl	Newark	DE		
Ruggiero; Marc	Wilmington	DE		
Smith, III; William Francis	Elkton	MD		
Yang; Alexander Yung Shing	Newark	DE		

US-CL-CURRENT: [504/128](#)

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	KMIC
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☐ 23. Document ID: US 5543383 A

L19: Entry 23 of 29

File: USPT

Aug 6, 1996

US-PAT-NO: 5543383

DOCUMENT-IDENTIFIER: US 5543383 A

TITLE: Herbicidal compositions comprising solutions of glyphosate and polyurea and/or polyurethane

DATE-ISSUED: August 6, 1996

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Parker; Brian A.	Nashua	NH		
Holejko; Longin V.	Arlington	MA		

US-CL-CURRENT: 504/360; 504/127, 504/128, 504/206

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	KMC
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☐ 24. Document ID: US 5536700 A

L19: Entry 24 of 29

File: USPT

Jul 16, 1996

US-PAT-NO: 5536700

DOCUMENT-IDENTIFIER: US 5536700 A

TITLE: Herbicidal compositions comprising aryl-5-haloalkylpyrazoles and glyphosate, it's salts, diquat or paraquat

DATE-ISSUED: July 16, 1996

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Woodard; Scott S.	Ballwin	MO		
Hamper; Bruce C.	Kirkwood	MO		
Moedritzer; Kurt	Webster Groves	MO		
Rogers; Michael D.	Maryland Heights	MO		
Mischke; Deborah A.	Defiance	MO		
Dutra; Gerard A.	St. Louis	MO		

US-CL-CURRENT: 504/128; 504/130, 504/136, 504/280, 548/377.1

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	KMC
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☒ 25. Document ID: US 5441923 A

L19: Entry 25 of 29

File: USPT

Aug 15, 1995

US-PAT-NO: 5441923

DOCUMENT-IDENTIFIER: US 5441923 A

TITLE: Water-soluble or water dispersible pesticide granules comprising sulfonylurea herbicides in a polyethylene or polypropylene coating

DATE-ISSUED: August 15, 1995

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Tocker; Stanley	Wilmington	DE		

US-CL-CURRENT: 504/125; 504/128, 504/134, 504/136, 504/211, 504/212, 504/213,
504/214, 504/215, 504/367

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	KWIC
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☐ 26. Document ID: US 5436223 A

L19: Entry 26 of 29

File: USPT

Jul 25, 1995

US-PAT-NO: 5436223

DOCUMENT-IDENTIFIER: US 5436223 A

TITLE: Argricultural formulations comprising fluroxypyr esters which are liquid at 25.degree. C.

DATE-ISSUED: July 25, 1995

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Mulqueen; Patrick J.	Abington			GB
Banks; Graham	Uffington			GB
Davies; John	Watlington			GB
Paterson; Eileen A.	Grove			GB
Snel; Marten	Wantage			GB

US-CL-CURRENT: 504/128; 504/130, 504/135, 504/136, 504/139, 504/255

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	KWIC
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☐ 27. Document ID: US 5393729 A

L19: Entry 27 of 29

File: USPT

Feb 28, 1995

US-PAT-NO: 5393729

DOCUMENT-IDENTIFIER: US 5393729 A

TITLE: 3-aryl-pyrone derivatives

DATE-ISSUED: February 28, 1995

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Fischer; Reiner	Monheim			DE
Krebs; Andreas	Odenthal			DE
Lieb; Folker	Leverkusen			DE
Ruther; Michael	Monheim			DE
Stetter; Jorg	Wuppertal			DE
Erdelen; Christoph	Leichlingen			DE
Wachendorff-Neumann; Ulrike	Monheim			DE
Lurssen; Klaus	Bergisch Gladbach			DE
Santel; Hans-Joachim	Leverkusen			DE
Schmidt; Robert R.	Bergisch Gladbach			DE

US-CL-CURRENT: 504/128; 504/140, 514/451, 514/456, 514/457, 544/149, 546/207,
546/22, 546/269.7, 546/275.4, 546/276.4, 546/280.4, 546/282.1, 549/216, 549/23,
549/285, 549/291, 549/292, 549/50, 549/60

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	KMIC
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☐ 28. Document ID: US 5196044 A

L19: Entry 28 of 29

File: USPT

Mar 23, 1993

US-PAT-NO: 5196044

DOCUMENT-IDENTIFIER: US 5196044 A

**** See image for Certificate of Correction ****

TITLE: Process and composition for controlling weeds

DATE-ISSUED: March 23, 1993

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Caulder; Jerry	San Diego	CA		
Crowley; R. Hugh	Oceanside	CA		
Zorner; Paul S.	La Costa	CA		
Evans; Steven L.	San Diego	CA		

US-CL-CURRENT: 504/127; 504/126, 504/128, 504/130, 504/131, 504/132, 504/135,
504/137, 504/139, 504/140, 504/141, 504/142, 504/143, 504/144, 504/145

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	KMIC
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☒ 29. Document ID: US 5071464 A

L19: Entry 29 of 29

File: USPT

Dec 10, 1991

US-PAT-NO: 5071464

DOCUMENT-IDENTIFIER: US 5071464 A

TITLE: Herbicidal agents

DATE-ISSUED: December 10, 1991

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Bauer; Klaus	Rodgau			DE
Bieringer; Hermann	Eppstein/Taunus			DE
Hacker; Erwin	Hochheim am Main			DE

US-CL-CURRENT: 504/128; 504/127

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	KMC
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File: USPT

Nov 23, 1999

DOCUMENT-IDENTIFIER: US 5990045 A
TITLE: Herbicidal mixtures

Abstract Text (1):

This invention relates to herbicidal mixtures comprising sulfonylureas together with glyphosate, herbicidal compositions of said mixtures, and a method for the use of said mixtures to control undesired vegetation.

Brief Summary Text (6):

EP 739893-A1 discloses

N-(4,6-dimethoxy-(1,3,5-triazin-2-yl)-N'-[[[3-3-fluoro-propyl)-2(3H)-thiazolylidene]amino]sulfonyl]urea as a herbicide, but this reference does not disclose its mixtures with glyphosate or their surprising utility in synergistically controlling weeds.

Brief Summary Text (8):

This invention relates to mixtures of a sulfonylurea compound of Formula I ##STR1## wherein X and Y are independently selected from H and F, and agriculturally suitable salts thereof with N-(phosphonomethyl)glycine (glyphosate, Formula II) ##STR2## and agriculturally suitable salts thereof, which have now been discovered to synergistically control weeds. This invention also relates to herbicidal compositions comprising effective amounts of the aforesaid mixtures and at least one of the following: surfactant, solid or liquid diluent. This invention also relates to a method for controlling undesired vegetation comprising applying to the locus of the vegetation herbicidally effective amounts of the aforesaid mixtures.

Brief Summary Text (9):

Agriculturally suitable salts of N-(phosphonomethyl)glycine (Formula II) include, but are not limited to, the salts described by Formula IIa ##STR3## wherein R.sup.1, R.sup.2 and R.sup.3 are independently selected from the group consisting of --OH and --OR.sup.4, wherein R.sup.4 is a salt-forming cation selected from the group consisting of alkali metals, alkaline earth metals, ammonium, and alkyl ammonium and mixtures thereof, provided that no more than two of R.sup.1, R.sup.2 and R.sup.3 are --OR.sup.4 when R.sup.4 is ammonium or alkyl ammonium and that no more than two of R.sup.1, R.sup.2 and R.sup.3 are --OH; R.sup.4 can also be alkyl sulfonium or alkyl sulfoxonium when R.sup.1 and R.sup.3 are --OH. Alkyl ammonium includes mono-, di-, tri- and tetra-alkylammonium. Alkyl sulfonium means trialkylsulfonium, and alkyl sulfoxonium means trialkylsulfoxonium, where the alkyl groups are independently C.sub.1 -C.sub.3 alkyl.

Brief Summary Text (11):

1. A herbicidal mixture comprising a sulfonylurea selected from N-(4,6-dimethoxy-1,3,5-triazin-2-yl)N'-[[[3-(3-fluoropropyl)-2(3H)-thiazolylidene]amino]sulfonyl]urea (Formula I, X and Y are H), N-(4,6-dimethoxy-1,3,5-triazin-2-yl)-N'-[[[3-(3,3,3-trifluoropropyl)-2(3H)-thiazolylidene]amino]sulfonyl]urea (Formula I, X and Y are F) and N-[[[3-(3,3-difluoropropyl)-2(3H)-thiazolylidene]amino]sulfonyl]-N'-(4,6dimethoxy-1,3,5-triazin-2-yl)urea (Formula I, X is H and Y are F) together with the mono (isopropylammonium) salt of N-(phosphonomethyl)glycine (Formula II) having the common name glyphosate-isopropylammonium.

Brief Summary Text (12):

2. A herbicidal mixture comprising a sulfonylurea selected from N-(4,6-dimethoxy-1,3,5-triazin-2-yl)-N'-[[[3-(3-fluoropropyl)-2(3H)-thiazolylidene]amino]sulfonyl]urea (Formula I, X and Y are H), N-(4,6-dimethoxy-1,3,5-triazin-2-yl)-N'-[[[3-(3,3,3-trifluoropropyl)-2(3H)-thiazolylidene]amino]sulfonyl]urea (Formula I, X and Y are F) and N-[[[3-(3,3-difluoropropyl)-2(3H)-thiazolylidene]amino]sulfonyl]-N'-(4,6-dimethoxy-1,3,5-triazin-2-yl)urea (Formula I, X is H and Y are F) together with the mono (trimethylsulfonium) salt of N-(phosphonomethyl)glycine (Formula II) having the common name glyphosate-trimesium.

Brief Summary Text (14):

1. A herbicidal mixture comprising N-(4,6-dimethoxy-1,3,5-triazin-2-yl)-N'-[[[3-(3-fluoropropyl)-2(3H)-thiazolylidene]amino]sulfonyl]urea (Formula I, X and Y are H) together with the mono (isopropylammonium) salt of N-(phosphonomethyl)glycine (Formula II) having the common name glyphosate-isopropylammonium.

Brief Summary Text (15):

2. A herbicidal mixture comprising N-(4,6-dimethoxy-1,3,5-triazin-2-yl)-N'-[[[3-(3-fluoropropyl)-2(3H)-thiazolylidene]amino]sulfonyl]urea (Formula I, X and Y are H) together with the mono (trimethylsulfonium) salt of N-(phosphonomethyl)glycine (Formula II) having the common name glyphosate-trimesium.

Brief Summary Text (16):

For reason of weed control spectrum and/or crop selectivity, the preferred crops for application of the mixtures of this invention are sugar beet lines, varieties and cultivars containing at least one gene that confers tolerance to herbicides containing N-(phosphonomethyl)glycine or an agriculturally suitable salt as the active ingredient.

Detailed Description Text (2):

The sulfonylureas of Formula I can be prepared as described in EP 592676-A1, WO 95/18806 (and its English language equivalent EP 739893-A1) and JP 07/330765-A. The synthesis involves the coupling of a imidothiazoline of Formula 1 with the chlorosulfonylurea of Formula 2, which in turn can be prepared from chlorosulfonyl isocyanate and the corresponding aminotriazine. ##STR4##

Detailed Description Text (3):

The mixtures of the present invention can include a sulfonylurea of Formula I in the form of agriculturally suitable salts thereof. These can be prepared in a number of ways known in the art. For example, metal salts can be made by contacting a sulfonylurea of Formula I with a solution of an alkali or alkaline earth metal salt having a sufficiently basic anion (e.g., hydroxide, alkoxide, carbonate or hydride). Quaternary amine salts can be made by similar techniques.

Detailed Description Text (4):

Salts of a sulfonylurea of Formula I can also be prepared by exchange of one cation for another. Cationic exchange can be effected by direct contact of an aqueous solution of a salt of a sulfonylurea of Formula I (e.g., alkali or quaternary amine salt) with a solution containing the cation to be exchanged. This method is most effective when the desired salt containing the exchanged cation is insoluble in water and can be separated by filtration.

Detailed Description Text (5):

Exchange may also be effected by passing an aqueous solution of a salt of a sulfonylurea of Formula I (e.g., an alkali metal or quaternary amine salt) through a column packed with a cation-exchange resin containing the cation to be exchanged for that of the original salt and the desired product is eluted from the column. This method is particularly useful when the desired salt is water soluble (e.g., a potassium, sodium or calcium salt).

Detailed Description Text (6):

N-(phosphonomethyl)glycine (Formula II) and its agriculturally suitable salts, including those of Formula IIa, can be prepared by methods described in U.S. Pat.

No. 4,315,765 and U.S. Pat. No. 4,405,531.

Detailed Description Text (15):

Solutions, including emulsifiable concentrates, can be prepared by simply mixing the ingredients. Chemically stabilized aqueous sulfonylurea or agriculturally suitable sulfonylurea salt dispersions are taught in U.S. Pat. No. 4,936,900. Solution formulations of sulfonylureas with improved chemical stability are taught in U.S. Pat. No. 4,599,412. Dusts and powders can be prepared by blending and, usually, grinding as in a hammer mill or fluid-energy mill. Suspensions are usually prepared by wet-milling; see, for example, U.S. Pat. No. 3,060,084. Granules and pellets can be prepared by spraying the active material upon preformed granular carriers or by agglomeration techniques. See Browning, "Agglomeration", Chemical Engineering, Dec. 4, 1967, pp 147-48, Perry's Chemical Engineer's Handbook, 4th Ed., McGraw-Hill, New York, 1963, pages 8-57 and following, and WO 91/13546. Pellets can be prepared as described in U.S. Pat. No. 4,172,714. Water-dispersible and water-soluble granules can be prepared as taught in U.S. Pat. No. 4,144,050, U.S. Pat. No. 3,920,442 and DE 3,246,493. Tablets can be prepared as taught in U.S. Pat. No. 5,180,587, U.S. Pat. No. 5,232,701 and U.S. Pat. No. 5,208,030. Films can be prepared as taught in GB No. 2,095,558 and U.S. Pat. No. 3,299,566.

Detailed Description Text (19):

Mixtures of compounds of Formula I and Formula II (including Formula IIa) are highly active postemergent herbicides, providing unexpected synergistic control of selected grass and broadleaf weeds. Because of the efficacy of the mixtures of the present invention in controlling weeds that commonly infest sugar beet fields, they are particularly valued for their selective tolerance by sugar beet plants containing at least one gene that confers resistance to N-(phosphonomethyl)glycine and its agriculturally suitable salts. Sugar beet varieties, cultivars, and lines that have been "gene-altered" to confer resistance to N-(phosphonomethyl)glycine can be developed by a variety of methods used individually or in combination including: modification to increase biosynthesis of 5-enolpyruvyl-3-phosphoshikimate synthase, incorporation of genes encoding 5-enolpyruvyl-3-phosphoshikimate synthase with structure modified to reduce its inhibition by N-(phosphonomethyl)glycine, and incorporation of genes encoding enzymes to degrade N-phosphonomethylglycine, by methods known in the art, including those described in WO 92/00377, WO 92/04449, WO 92/06201 and WO 92,19719, U.S. Pat. No. 4,940,835, U.S. Pat. No. 4,971,908, U.S. Pat. No. 5,188,642 and U.S. Pat. No. 5,310,667.

Detailed Description Text (23):

The Formula I sulfonylureas (Compound 1, 2 and 3) are tested in combination with the mono isopropylamine salt of N-(phosphonomethyl)glycine (Formula II) (Compound 4).
##STR5##

Detailed Description Paragraph Table (2):

	Example A High Strength Concentrate
N-(4,6-dimethoxy-1,3,5-triazin-2-yl)-N'-[[[3-(3-fluoropropyl)-	4.7%
2(3H)-thiazolylidene]amino)sulfonyl]urea	<u>glyphosate</u> -isopropylammonium
aerogel	93.8% silica
0.5% synthetic amorphous fine silica	1.0%. Example B Wettable Powder
N-(4,6-dimethoxy-1,3,5-triazin-2-yl)-N'-[[[3-(3-fluoropropyl)-	5.0%
2(3H)-thiazolylidene]amino)sulfonyl]urea	<u>glyphosate</u> -trimesium
polyethylene glycol ether	60.0% dodecylphenol
2.0% sodium ligninsulfonate	4.0% sodium silicoaluminate
6.0% montmorillonite (calcined)	23.0%. Example C Granule
N-(4,6-dimethoxy-1,3,5-triazin-2-yl)-N'-[[[3-(3-fluoropropyl)-	0.8%
2(3H)-thiazolylidene]amino)sulfonyl]urea,	sodium salt <u>glyphosate</u> -isopropylammonium
9.2% attapulgite granules (low volatile matter,	90.0%. 0.71/0.30 mm; U.S.S. No.
25-50 sieves)	Example D Aqueous Solution Suspension
N-(4,6-dimethoxy-1,3,5-triazin-2-yl)-N'-[[[3-(3-fluoropropyl)-	0.1%
2(3H)-thiazolylidene]amino)sulfonyl]urea	<u>glyphosate</u> -isopropylammonium
attapulgite	24.9% hydrated
3.0% crude calcium ligninsulfonate	10.0% sodium dihydrogen phosphate
0.5% water	61.5%. Example E Extruded Pellet
N-(4,6-dimethoxy-1,3,5-triazin-2-yl)-N'-[[[3-(3-fluoropropyl)-	0.2%
2(3H)-thiazolylidene]amino)sulfonyl]urea	<u>glyphosate</u> -isopropylammonium
anhydrous sodium sulfate	24.8%
10.0% crude calcium ligninsulfonate	5.0% sodium
alkylnaphthalenesulfonate	1.0% calcium/magnesium bentonite
59.0%. Example F Wettable Powder	N-(4,6-dimethoxy-1,3,5-triazin-2-yl)-N'-[[[3-(3-fluoropropyl)-
	0.1%

- . 2(3H)-thiazolylidene]amino]sulfonyl]urea glyphosate-isopropylammonium 64.9% dodecylphenol polyethylene glycol ether 2.0% sodium ligninsulfonate 4.0% sodium silicoaluminate 6.0% montmorillonite (calcined) 23.0%. Example G Extruded Pellet N-(4,6-dimethoxy-1,3,5-triazin-2-yl)-N'-[[[3-(3,3,3-trifluoro- 0.6% propyl)-2(3H)-thiazolylidene]amino]sulfonyl]urea glyphosate-isopropylammonium 24.4% anhydrous sodium sulfate 10.0% crude calcium ligninsulfonate 5.0% sodium alkyl naphthalenesulfonate 1.0% calcium/magnesium bentonite 59.0%.
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Current US Original Classification (1):

504/128

CLAIMS:

1. A herbicidal mixture comprising synergistic herbicidally effective amounts of a compound of Formula I ##STR6## wherein X and Y are independently selected from H and F, or an agriculturally suitable salt thereof,

and the compound of Formula II ##STR7## which is N-(phosphonomethyl)glycine (glyphosate) or an agriculturally suitable salt thereof.

8. The composition of claim 5 wherein the undesired vegetation is the vegetation in a crop of sugar beet plants containing at least one gene that confers resistance to glyphosate and its agriculturally suitable salts.

12. The method of claim 9 wherein the locus to be protected is a crop of sugar beet plants containing at least one gene that confers resistance to glyphosate and its agriculturally suitable salts.

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Feb 16, 1999

DOCUMENT-IDENTIFIER: US 5872078 A

TITLE: Glyphosate formulationsBrief Summary Text (4):

Glyphosate (N-phosphonomethylglycine) is well known in the art as an effective herbicide. It is also known that glyphosate, an organic acid, is relatively insoluble in water. Glyphosate is typically formulated as a water-soluble salt, especially as the isopropylamine salt (IPA salt) to kill or control weeds or plants. Glyphosate is typically sold commercially as an aqueous concentrate.

Brief Summary Text (5):

Various salts of glyphosate, methods for preparing salts of glyphosate, formulations of glyphosate and methods of use for killing and controlling weeds and plants are disclosed in U.S. Pat. Nos. 3,799,758 and 4,405,531 issued to John E. Franz on Mar. 26, 1974 and Sep. 20, 1983 respectively. Other US patents which disclose salts of glyphosate include U.S. Pat. No. 4,315,765 issued to George B. Large on Feb. 16, 1982, U.S. Pat. No. 4,507,250 issued to Izak Bakel on Mar. 26, 1985, U.S. Pat. No. 4,397,676 issued to Izhak Bakel on Aug. 9, 1983, U.S. Pat. No. 4,481,026 issued to Michael P. Prisbylla on Nov. 6, 1984 and, U.S. Pat. No. 4,140,513 issued to Erhard J. Prill on Feb. 20, 1979. The aforementioned patents are incorporated herein in their entirety by reference.

Brief Summary Text (6):

EPO published patent application 204146 discloses a herbicidal composition comprising (a) 2-(4-chloror-2-fluor 5-propargyloxyphe-nyl) -5,6,7,8-tetrahydro-1H-1,2,4-triazolo (1,2-s)phridazine -1,3, -2H-dione (I), with (b) glyphosate (i) glufosinate (ii) bialaphos (iii) and/or paraquat (iv) or their salts and an inert carrier or diluent.

Brief Summary Text (8):

Published Japanese patent applications J62175407 and J62175408 disclose a herbicide containing solid carrier, additives and herbicidal component and has a particle size of 48-150 mesh. Disclosed herbicidal components are ((3-amino-3-carboxy)propyl-1)methylphosphonic acid, N-(phosphonomethyl)glycine, (2-amino-4-methylphosphino-butyral) alanylalanine and their salts.

Brief Summary Text (11):

EPO Publication No. WO 87/04595 discloses a herbicidal water-soluble dry particulate glyphosate formulation comprising the sodium salt of glyphosate and a surface active agent of the formula: ##STR1## wherein R.sub.1 and R.sub.2 are independently methyl or ethyl, R.sub.3 is methyl, ethyl benzyl or C.sub.10 to C.sub.18 alkyl, R.sub.4 is C.sub.10 to C.sub.18 alkyl and X is chloro or bromo.

Brief Summary Text (12):

Japanese LOP 145 205-88 discloses an aqueous concentrate herbicidal formulation comprising a water soluble glyphosate salt, ammonium sulfate and a quaternary ammonium salt.

Brief Summary Text (13):

PCT/WO 87-04,712 discloses a method of preparing a particulate alkali metal salt of N-phosphonomethylglycine which comprises adding a solid alkali metal base with agitation to N-phosphonomethylglycine containing up to 25% water.

Brief Summary Text (14):

Research Disclosure Publication 27161 November 1986 "Novel Glyphosate acid wettable powder formulation effective in control of weeds" discloses a formulation comprising N-phosphonomethylglycine, nonionic surfactant, diatomaceous earth, inorganic salt (ammonium sulphate) and an antifoaming agent.

Brief Summary Text (15):

Chemical Abstracts 103: 191395K (1985) Davydov, A. M.; Vechtomova, T. N.; Banzunova, G. G. (USSR). Sashch. Rast. (Moscow) 1985, (9), 40-1 (Russ) discloses that the 36% aq. soln. Utal (I) [96638-41-4] and the 50% wettable powder Fosulen (II) are Soviet brands of glyphosate.

Brief Summary Text (17):

The invention comprises a dry, water soluble, agriculturally acceptable herbicidal composition comprising a water soluble salt of N-phosphonomethylglycine as a water-dispersible granule, water soluble granule, or water-dispersible powder or water soluble powder although water soluble granules are preferred. The composition comprises a water soluble salt of N-phosphonomethylglycine and additionally one or more liquid surfactants. In another embodiment, the invention further comprises said composition containing water.

Brief Summary Text (19):

In a process for preparing the composition of this invention, the dry, water soluble, granular, agriculturally acceptable composition is prepared by pan, extrusion, fluid bed (or equivalent) granulation of N-phosphonomethylglycine, N-phosphonomethylglycine and surfactant, or a water soluble salt of N-phosphonomethylglycine, optionally with a surfactant.

Brief Summary Text (20):

In another embodiment of this invention, said composition is prepared by admixing N-phosphonomethylglycine or an agriculturally acceptable salt of N-phosphonomethylglycine with one or more liquid surfactants.

Brief Summary Text (23):

Yet another method of preparing the granular compositions of this invention involves admixing glyphosate and base, for example ammonium bicarbonate, with water, crystallizing, centrifuging and blending in the surfactant and drying the granular product.

Brief Summary Text (24):

In still another method for preparing the granular composition of the invention, involves carrying out the reaction of the ingredients in a fluid bed drier using glyphosate wet cake or moistened glyphosate containing a minimum of moisture to provide occurrence of the neutralization phase of the process and then completion by drying to give the granular product.

Brief Summary Text (25):

Compositions may be optionally mixed with ammonium sulfate and optionally one or more additional herbicides and thereafter these ingredients blended to form said admixed composition. The order of addition of the ingredients to the starting material, typically glyphosate or a water soluble salt thereof is not critical. The admixed composition is optionally granulated with equivalent means or in an equivalent manner to form a composition of this invention.

Brief Summary Text (34):

The invention comprises a dry, water soluble, agriculturally acceptable herbicidal composition comprising a water soluble salt of N-phosphonomethylglycine and (optionally) a liquid surfactant.

Brief Summary Text (40):

It may be preferred to utilize a solid, water insoluble co-herbicide. In that embodiment, the co-herbicide is present in the composition as a fine powder. Illustrative coherbicides include sulfonylureas such as [Oust (2-[3-(4,6-dimethylpyrimidin-2-yl)ureidosulphonyl]benzoic acid) and Glean

(1-(2-chlorophenylsulphonyl)-3-(4-methoxy-6-methyl-1,3,5-triazin-2-yl)urea)], Ally (Methyl 2-[[[4-methoxy-4-methyl-1,3,5-triazin-2-yl)amino]carbonyl]-amino]-sulfonyl]-benzoate), Classic (Ethyl 2-[(4-chloro-6-methoxy-pyrimidin-2-yl)amino]-carbonyl]amino]-sulfonyl]-benzoate), Diuron (N'-(3,4-dichlorophenyl)-N,N-dimethylurea), Linuron (3-(3,4-dichlorophenyl)-1-methoxy-1-methylurea), atrazine ((2-chloro-4-(ethylamino)-6-(isopropylamino)-s-triazine, simazine (2-chloro-4,6-bis(ethylamino)-5-triazine), mixtures thereof and the like.

Brief Summary Text (41):

The water insoluble co-herbicide may be liquid or solid present in said composition as a water dispersible granule such as atrazine ((2-chloro-4-(ethylamino)-6-(isopropylamino)-s-triazine, fomesafen (5-[2-chloro-4-(trifluoromethyl)-phenoxy]-N-methylsulfonyl)-2-nitrobenzamide), oxyfluorfen (2-chloro-1-(3-ethoxy-4-nitrophenoxy)-4-(trifluoromethyl)-benzene), feroe ([fenoxaprop-ethyl:(.+-.)-ethyl-2,4-(6-chloro-2-benzoxazolyl)oxy+phenoxy]propanoate), simazine, (2-chloro-4,6-bis(ethylamino)-5-triazine), diuron (N'-(3,4-dichlorophenyl)-N,N-dimethylurea), Ally (Methyl 2-[[[4-methoxy-4-methyl-1,3,5-triazin-2-yl)amino]carbonyl]-amino]sulfonyl]-benzoate), Classic (Ethyl 2-[(4-chloro-6-methoxy-pyrimidin-2-yl)-amino]-carbonyl]amino]sulfonyl]-benzoate), Linuron (3-(3,4-dichlorophenyl)-1-methoxy-1-methylurea), Oust (2-[3-(4,6-dimethylpyrimidin-2-yl)ureidosulphonyl]-benzoic acid), Glean (1-(2-chlorophenylsulphonyl)-3-(4-methoxy-6-methyl-1,3,5-triazin-2-yl)urea)], mixtures thereof and the like.

Brief Summary Text (42):

The glyphosate salt component of the compositions of this invention may be preferably prepared by admixing various bases (acid acceptors) including those selected from those listed below with glyphosate wet cake or moistened glyphosate. Ammonia, ammonium hydroxide, ammonium and alkali metal carbonates, bicarbonates, meta borates, citrates, formates, oxalates, phosphates, propionates, pyrophosphates, metasilicates, orthosilicates, sulfites, thiosulfates, tetraborate, monoacid phosphates, tripolyphosphates, metaphosphates, sodium hydroxide, potassium hydroxide, tetrasodium EDTA, mixtures thereof and the like. Mixtures of glyphosate and salts thereof may be employed as starting materials.

Brief Summary Text (43):

As employed herein, the term "admixed" includes reaction, neutralization and partial neutralization of glyphosate as well as mixed with and sprayed on, combined with or added to another ingredient(s).

Brief Summary Text (44):

Suitable liquid surfactants include nonionic surfactants, anionic surfactants, cationic surfactants and amphoteric surfactants, mixtures thereof and the like, preferably ones that provide increased herbicidal activity of N-phosphonomethylglycine. Most preferred surfactant is an ethoxylated tallow amine containing 15-18 moles of ethylene oxide.

Brief Summary Text (49):

Preferable agriculturally acceptable salts of N-phosphonomethylglycine (glyphosate) include the ammonium, isopropylamine, trimethylsulfonium, iminurea salts, sodium, potassium, mixtures thereof and the like. The sodium and ammonium salts of N-phosphonomethylglycine are especially preferred in this invention. Mixtures of water soluble salts of N-phosphonomethylglycine may be employed herein as well as surfactant salts of N-phosphonomethylglycine including, for example, a N,N-bis(hydroxyethyl)cocoamine salt of N-phosphonomethylglycine,

Brief Summary Text (50):

Most preferred water-soluble granules (WSGs) are those made with the ammonium salt or sodium salt of glyphosate and an ethoxylated tallowamine surfactant (tallowamine+15-20 moles of ethylene oxide) as the surfactant.

Brief Summary Text (52):

If desired, a dry, water soluble, agriculturally acceptable composition comprising a

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Feb 4, 1997

DOCUMENT-IDENTIFIER: US 5599769 A

TITLE: Synergistic herbicidal compositions comprising glyphosate or glufosinate in combination with a sulfonylurea herbicideAbstract Text (1):

Synergistically increased effects against undesirable plant growth are achieved by a combined application of an active substance of the type A with an active substance of the type B, where type A represents the herbicides glufosinate (A1), glyphosate (A2), or salts thereof, and type B represents sulfonyl ureas of the formula (B) ##STR1## where R.sup.1 is a radical from the group comprising 2-ethoxyphenoxy, 2-propoxyphenoxy, 2-isopropoxyphenoxy, 2-methoxycarbonylphenyl, 3-(dimethylaminocarbonyl)-pyrid-2-yl, 3-ethylsulfonylpyrid-2-yl, 3-[N-(C.sub.1-C.sub.4 -alkyl)-N-(C.sub.1-C.sub.4 -alkylsulfonyl)amino]pyrid-2-yl, (N-methyl-N-methylsulfonyl)aminosulfonyl, 2-(2-chloroethoxy)phenyl, 2-(methoxycarbonyl)phenyl, 2-(meth-oxycarbonyl)thien-3-yl,

Brief Summary Text (3):

Glyphosate is also a known herbicide for controlling annual and perennial weeds and grass weeds. It also acts via post-emergence application and foliar uptake; cf. the abovementioned "The Pesticide Manual", p. 449.

Brief Summary Text (4):

Application is mainly carried out in plantation crops and on areas which are not under cultivation. In the case of commercially available products, the monoisopropyl ammonium salt of glyphosate is used.

Brief Summary Text (5):

Surprisingly, some herbicidal active substances have now been found in biological tests which, when applied together with glufosinate-ammonium or glyphosate, result in pronounced synergistically increased effects.

Brief Summary Text (14):

Preferred salts of the compounds of the formula A1 and A2 are ammonium salts, mono-, di- and trialkylammonium salts, alkali metal salts and alkaline earth metal salts. The monoammonium salt of glufosinate (A1-1) and the monoisopropylammonium salt of glyphosate (A2-1) are particularly preferred. Glufosinate exists in the D- and L-form and mixtures of these, for example in the form of a racemate. Formula A1 embraces all abovementioned spatial configurations and their mixtures, preference being given to the racemate and to the L-form and their mixtures.

Brief Summary Text (37):

The compound of the formula (B5) is known under the name of nicosulfuron or SL-950 (see F. Kimura et al., Brighton Crop Protection Conference-Weeds-1989, pages 29-34). Nicosulfuron (SL-950), i.e. 3-(4,6-dimethoxypyrimidin-2-yl)-1-(3-dimethylaminocarbonylpyridin-2-ylsulfonyl)urea, is a sulfonylurea herbicide which has been employed to date mainly for controlling grasses and broad-leaved weeds in corn. Applied post-emergence, a large number of annual and perennial weeds and grass weeds are controlled.

Brief Summary Text (43):

Some combinations of compounds of the formula (A2) and sulfonylureas are already known; see S. B. Horsley, Proc. Northeast. Weed Sci. Soc. 42, 84 (1988); H. R.

- . Mashadi and J. O. Evans, Res. Prog. Rep. West. Soc. Weed Sci. 1987 Meet., 348-50; K. E. Bowren, G. S. Noble, Res. Rep. Expert Comm. Weeds West. Can. (33 Meet.) Vol. 2, 240 (1986); D. G. Pchajek, J. D. Gingerich, Res. Rep. Expert Comm. Weeds West. Can. (34 Meet.) Vol. 2, 524-26 (1987).

Brief Summary Text (50):

The dosage rates of the herbicides A in the active substance combinations are preferably between 10 and 2500 g/ha, based on active ingredient. Glufosinate is preferably applied in amounts of 10 to 1200 g/ha, and glyphosate is preferably applied in amounts of 500 to 2000 g/ha. The dosage rates of compounds of type B are generally from 2 to 200 g/ha, preferably from 2 to 120 g/ha, in particular from 2 to 100 g/ha, based on active ingredient.

Detailed Description Paragraph Table (2):

TABLE 2 _____ Combination (A2-1) + (B1) on *Cyperus rotundus*
 Dosage Herbical active rate in substance g ai/ha Action in %
 _____ (A2) 1080 80 2160 93 (B1) 60 5 (A2-1) + (B1)
 1080 + 60 95 _____ Table 2 abbreviations: (A21) =
 monoisopropylammonium salt of glyphosate in the form of an aqueous formulation, added to the tankmix at a dosage rate of 480 g/l (B1) = see Table 1

Current US Original Classification (1):

504/128

Other Reference Publication (2):

Northeastern Weed Science Society, vol. 42, 1988, Proceedings, S. B. Horsley: "Tank mixing glyphosate with adjuvants and other herbicides for striped maple control", p. 84.

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Oct 29, 1996

DOCUMENT-IDENTIFIER: US 5569639 A

TITLE: Dry flowable agricultural compositions of glyphosate and sulfonylurea herbicides made without drying of the final productAbstract Text (1):

A dry flowable agricultural composition made by mixing glyphosate and an anhydrous base salt with a sulfonylurea herbicide and stabilizer (sodium metasilicate or sodium carbonate), all of which is combined a heat activated binder without using a drying step.

Brief Summary Text (2):

The present invention comprises a dry flowable agricultural composition of N-(phosphonomethyl)glycine (defined hereinafter as glyphosate) with and without a sulfonylurea herbicide and processes for the preparation of the composition without a drying step.

Brief Summary Text (3):

WO91/13546 discloses the preparation of dry flowable agricultural compositions comprising an active ingredient, binder and chemical stabilizer. Among the active ingredients disclosed are various sulfonylureas and N-(phosphonomethyl)glycine (glyphosate) with a disclosure that one or more may be used.

Brief Summary Text (4):

While generally useful for granulation without drying, WO91/13546 would not be useful for processing wetcake glyphosate or wet glyphosate salt without treatment according to the present invention.

Brief Summary Text (5):

WO90/07275 describes the preparation of glyphosate compositions or glyphosate salt granule compositions containing liquid surfactants. The ability to utilize a co-herbicide in the compositions is disclosed, and several sulfonylurea herbicides, including metsulfuron methyl, are specifically named.

Brief Summary Text (6):

The processes of the prior art have the disadvantage of requiring a drying step at some stage of production of the formulations disclosed and because the final products contain environmentally-sensitive chemicals such as sulfonylureas and other potentially volatile components, large and expensive air-purification systems are necessary in drying operations to prevent untoward chemical release.

Brief Summary Text (8):

The compositions of the invention are dry flowable agricultural compositions comprising glyphosate or glyphosate salt with a sulfonylurea. The process of the invention produces a free flowing granular composition without a drying step by heating. The resulting granules can also be described as free flowing, non-caking, low attrition glyphosate compositions.

Brief Summary Text (11):

(1) 1-70% wet glyphosate or wet glyphosate salt,

Brief Summary Text (19):

(f) blending 0.1-40% of an anhydrous base salt with 1-70% wet glyphosate or wet

- glyphosate salt to form a blended mixture I,

Brief Summary Text (24):

- (4) 0-40% of a sulfonylurea herbicide to form blended mixture II,

Brief Summary Text (29):

wherein all of the above percentages are by weight based on the composition provided when a sulfonylurea is present the stabilizer is 0.1-20%.

Brief Summary Text (30):

The process of the invention is more advantageous when the glyphosate is a wetcake. Most preferably, the process of the invention is by process B. However, the process of the invention can also be carried out with glyphosate that has been previously dried because even when using dry glyphosate the resulting composition using some prior art methods would require drying. The processes of the invention do not require drying of the composition made from dry or from wet glyphosate. Preferably, the process of the invention is carried out with the presence of a sulfonylurea herbicide and stabilizer, but it also can be carried out without a sulfonylurea herbicide and without a stabilizer.

Brief Summary Text (31):

Another embodiment of the invention is a free flowing, non-caking, low attrition agriculturally suitable glyphosate composition comprising in weight percent based on the total composition weight

Brief Summary Text (32):

- (1) 1-70% previously dried or wetcake glyphosate or a wet glyphosate salt,

Brief Summary Text (39):

- (8) 0.1-40% sulfonylurea herbicide

Brief Summary Text (42):

- (1) 20-60% of the glyphosate or glyphosate salt,

Brief Summary Text (49):

- (8) 0.5-20% sulfonylurea herbicide

Brief Summary Text (52):

When a glyphosate salt is used, the preferred cation is sodium.

Brief Summary Text (56):

Both glyphosate and the sulfonylureas hereinafter described are known herbicides.

Brief Summary Text (57):

What is meant by glyphosate is N-(phosphonomethyl)glycine of the structural formula ##STR1##

Brief Summary Text (58):

The preferred sulfonylurea herbicides are methyl
2-[[[(4-methoxy-6-methyl-1,3,5-triazin-2-yl)amino]-carbonyl]amino]sulfonyl]benzoate (metsulfuron methyl) and methyl
2-[[[(4,6-dimethyl-2-pyrimidinyl)amino]-carbonyl]amino]sulfonyl]benzoate.

Detailed Description Text (2):

Conventional methods for preparing products containing glyphosate herbicide involve drying steps to remove water with heat at one or more stages of production.

"Wetcake" glyphosate, so named because it can contain 2-20% water (typically 7-12% water) is obtained after processing of technical glyphosate acid. Prior to this invention, no granules of glyphosate prepared from "wetcake" glyphosate without a drying step were:

Detailed Description Text (3):

1) stable to chemically sensitive mixing partners such as sulfonylurea herbicides in the compositions,

Detailed Description Text (6):

In the prior art, even sulfonylurea/glyphosate compositions prepared from dry glyphosate have required drying of the final product. Now according to the present invention drying for either situation is not necessary.

Detailed Description Text (7):

The instant invention comprises a novel composition and a novel process for preparing dry flowable compositions of glyphosate which do not require drying steps at any stage in the preparation. What is meant by drying is subjecting to heat or other means for the purpose of removing water. The sulfonylureas in the novel compositions of this invention do not decompose in the presence of the water because the water is believed to exist as crystalline water of hydration of the base salt, and thus is innocuous. The compositions of the instant invention are also free-flowing, non-caking, low attrition granules. Prior art granules made without a drying step are soft compositions without a stable structure.

Detailed Description Text (9):

Various salts are known to effect glyphosate activity and are routinely added to enhance weed control (e.g., see Nalewaja and Matysiak in Weed Science, 1991, 39, 622). Another advantage of the present invention is that the base salts known to enhance biological efficacy are already present and therefore need not be tank-mixed at the time of application.

Detailed Description Text (10):

A third advantage is that the binder present in the compositions of the present invention enhances the activity of the glyphosate. Normally, surfactants are tank-mixed with glyphosate to obtain a comparable improvement in efficacy and their use in tank-mixing is not necessary for the present compositions.

Detailed Description Text (11):

The nature of the glyphosate herbicide incorporated into the compositions can be acid "wetcake", dry acid, or a wet salt of the acid. When "wetcake" glyphosate, dry glyphosate or wet salt is used, an anhydrous base salt is added to make the glyphosate acid or salt composition of the invention which is a

Detailed Description Text (13):

2) inert to decomposition of a sulfonylurea mixed with the glyphosate in the composition, and

Detailed Description Text (20):

The stabilizer is not required in the process of the invention when glyphosate or its salt is the only active ingredient.

Detailed Description Text (21):

However, when dry glyphosate acid, wetcake glyphosate acid, or wet glyphosate salt are used in mixtures with sulfonylureas, then the weight percent of the stabilizer is greater than zero. Even "dry" glyphosate forms when mixed with the various components of processes of the prior art require drying. However, the compositions of this invention and the process of the invention do not require any drying step whether the starting glyphosate is wet or dry or whether a sulfonylurea is present or absent.

Detailed Description Text (22):

Useful anhydrous base salts are those which have hydrated forms with melting points above 60.degree. C. Useful anhydrous base salts have cations that include ammonium, lithium, potassium, sodium, and polyvalent cations as that part of the salt with carbonate, carbonate/phosphate blends, citrate, metaborate, metasilicate, pyrophosphate, sulfate and tetraborate, as well as others. Ammonium salts are less desirable because of the problem of evolving ammonia. Potassium salts are less desirable because of the problem of forming hygroscopic compositions. Lithium salts are useful but can be more expensive than the corresponding sodium salt. Polyvalent cationic salts are useful but can deactivate glyphosate. Therefore, sodium base salts are preferred.

Detailed Description Text (23):

- The use of anhydrous base salts that have hydrated forms with melting points less than 60.degree. C. are ineffective in the compositions of the present invention with "wetcake". The sulfonylurea in the composition decomposes to such an extent that ineffective herbicidal formulations result. Anhydrous disodium phosphate has a hydrated form with a melting point below 60.degree. C. When disodium phosphate was used instead of sodium pyrophosphate in Example 1 below, the components formed a solid mass which was inoperable as an agricultural formulation. However, disodium phosphate is effective in compositions with dry glyphosate acid as illustrated in Example 13 below.

Detailed Description Text (25):

Suitable stabilizers comprise metal carbonate salts, metal acetate salts, or metal metasilicate salts which protect the sulfonylurea from decomposition in the formulation. The metal salts comprise divalent and monovalent metals.

Detailed Description Text (26):

Metal carbonate or metal metasilicate salts are used when glyphosate wetcake or wet glyphosate salt is used. Sodium carbonate or sodium metasilicate are preferred. When Example 1 below was repeated without sodium carbonate as the stabilizer, a 33% decomposition of metsulfuron methyl was observed after 1 week at 54.degree. C. Similarly, when sodium acetate was used instead of sodium carbonate, 30% decomposition of the sulfonylurea was observed. When Example 12 was repeated without sodium carbonate as the stabilizer utilizing additional anhydrous base salt there was a 30% loss of metsulfuron methyl after two weeks at 54.degree. C.

Detailed Description Text (27):

In addition to metal carbonates and metal metasilicates, metal acetate salts, preferably sodium acetate, may be used as stabilizers when dry glyphosate acid is used. As indicated in Example 14 hereinafter, when sodium acetate was used instead of sodium pyrophosphate (the anhydrous base) and sodium carbonate, <5% decomposition of metsulfuron methyl was observed after two weeks at 54.degree. C.

Detailed Description Text (35):

A "sulfonylurea herbicide" can be any one of the entire class of herbicides containing the following structural moiety, and any closely related chemical functionalities. ##STR2##

Detailed Description Text (36):

Preferred are compositions wherein the sulfonylurea herbicide is a compound of the formula ##STR3## wherein: J is ##STR4## R is H or CH₃; R¹ is F, Cl, Br, NO₂, C₁-C₄ alkyl, C₁-C₄ haloalkyl, C₃-C₄ cycloalkyl, C₂-C₄ haloalkenyl, C₁-C₄ alkoxy, C₁-C₄ haloalkoxy, C₂-C₄ alkoxyalkoxy, CO₂R¹², C(O)NR¹³, R¹⁴, SO₂NR¹⁵, R¹⁶, S(O)_nR¹⁷, C(O)R¹⁸, CH₂CN or L;

Detailed Description Text (62):

Even more preferred are compositions wherein the sulfonylurea is selected from the group:

Detailed Description Text (79):

A process for preparing the compositions is described in the instant invention. The process comprises first blending the glyphosate with an anhydrous base salt. All other components except the binder are then added and the mixture is milled to a powder. The powder is combined with a binder in a V-blender, and then tumbled and heated to about 60.degree.-70.degree. C. The granules are then cooled to about 50.degree. C. or lower and collected.

Detailed Description Text (80):

The preferred process is that in which the glyphosate is in the form of a wetcake.

Detailed Description Text (81):

A particular preferred composition of the invention as described above includes a sulfonylurea selected from the group consisting of chlorsulfuron; sulfometuron methyl; chlorimuron ethyl; metsulfuron methyl; tribenuron methyl; bensulfuron

methyl; nicosulfuron; triasulfuron; methyl 2-[[[(4,6-dimethoxy-2-pyrimidinyl) amino]carbonyl]amino]sulfonyl]-6-(trifluoromethyl)-3-pyridinecarboxylate; methyl 2-[[[(4-ethoxy-6-(methylamino)-1,3,5-triazin-2-yl)-amino]carbonyl]amino]sulfonyl]benzoate; ethyl 5-[[[(4,6-dimethoxy-2-pyrimidinyl) amino]carbonyl]amino]-sulfonyl]-1-methyl-1H-pyrazole-4-carboxylate; N-[[[(4,6-dimethoxy-2-pyrimidinylamino)carbonyl]-3-(ethyl-sulfonyl)-2-pyridinesulfonamide; N-[[[(4,6-dimethoxy-2-pyrimidinyl) amino]carbonyl]-1-methyl-4-(2-methyl-2H-tetrazol-5-yl)-1H-pyrazole-5-sulfonamide; and methyl 2-[[[(4-(dimethylamino)-6-(2,2,2-trifluoroethoxy)-1,3,5-triazin-2-yl)amino]carbonyl]amino]sulfonyl]-3-methylbenzoate.

Detailed Description Text (82):

The heating step in the process is not a drying step but an activation of the binder. No weight loss (e.g., through water loss) was observed when a blender containing wetcake glyphosate and the other ingredients of the compositions of this invention was weighed before and after heat activation. A drying step in a typical formulation process requires longer heating times, higher temperatures, and a forced air system to remove the water vapor and other volatiles. As indicated above, the forced air must be purified to prevent contamination of the environment, and these purification systems are large and expensive. No such purification systems are required in the heat activation step in the process of the present invention.

Detailed Description Text (83):

The fact that the final composition weight equals the sum of the weights of the components suggests that the anhydrous base salt converts free water from glyphosate wetcake to crystalline waters of hydration. Waters of hydration are not removed in the heat activated granulation step, do not decompose sulfonylureas, and do not facilitate reaction of glyphosate with the stabilizer. If free water were present and sodium carbonate was the stabilizer, glyphosate would react with the sodium carbonate to liberate carbon dioxide and the sulfonylurea would decompose. No weight loss occurred during heat activated granulation and the sulfonylureas remained stable. Therefore our hypothesis is that the base salt reacts with free water to form water of hydration.

Detailed Description Text (89):

A mixture of 45.88 g of "wetcake" glyphosate (11% water, 86.3% a.e.) and 31.67 g of anhydrous sodium pyrophosphate as blended in a Black and Decker Handy Chopper.RTM. mill for 10 minutes, and hammer-milled through a 0.02 rh screen. All other components except the binder, i.e., 1.10 g of 10X sugar, 0.55 g of Soap L.RTM., 1.16 g of metsulfuron methyl and 9.85 g of sodium carbonate, were hammer-milled through a 0.02 rh screen.

Detailed Description Text (90):

The milled glyphosate/base salt mixture and milled powders were blended together for 5 minutes, combined with 19.8 g of Pluronic.RTM. F108 (<40 mesh), an ethylene oxide/propylene oxide block polymer with 80% ethylene oxide and 20% propylene oxide units, in a V-blender, tumbled as the temperature of the powders were brought to 70.degree. C. with a hair dryer, cooled to 50.degree. C. and the granules collected.

Detailed Description Text (94):

Example 1 was repeated using 45.88 g of glyphosate (11% water, 86.3% a.e.), 25.08 g of anhydrous sodium pyrophosphate, 1.10 g of 10X sugar, 0.55 g of Soap L.RTM., 1.15 g of metsulfuron methyl (95%), 9.85 g of sodium carbonate and 26.40 g of Macol.RTM.DNP 150 (20/80 mesh), a polyethylated dinonylphenol with 150 ethylene oxide units made by Mazer Chemicals. The granules dissolved in 90 seconds.

Detailed Description Text (114):

Example 1 was repeated using 45.88 g of glyphosate (11% water, 86.3% a.e.), 14.25 g of anhydrous sodium pyrophosphate, 1.10 g of 10 sugar, 0.55 g of Soap L.RTM. (sodium stearate), 11.00 g of Lomar.RTM. PW (a dispersing agent comprising a condensed naphthalene sulfonate), 1.10 g of Wessalon.RTM. 50S (a precipitated silica filler/carrier), 3.43 g of metsulfuron methyl (95%), 10.69 g of sodium carbonate and

- 22.00 g of Macol.RTM. DNP 150 (<20 mesh). The Lomar.RTM. PW and Wessalon.RTM. 50S were combined with the sugar, Soap L.RTM., metsulfuron methyl and sodium carbonate.

Detailed Description Text (116):

Examples 12-15 illustrate that the dry acid form of glyphosate may be used to produce granules without drying of the final products. In these cases, anhydrous bases for which the hydrated forms melt below 60.degree. C. may be added. Stabilizers are required.

Detailed Description Text (118):

A mixture of 40.82 g of glyphosate acid (97% a.e.), 34.53 g of sodium pyrophosphate, 1.10 g of 10X sugar and 0.55 g of Soap L.RTM. were blended in a Black and Decker Handy Chopper.RTM. mill for 10 minutes, and hammer-milled through a 0.02 rh screen. 1.16 g of metsulfuron methyl and 9.85 g of sodium carbonate were similarly blended for 10 minutes, and hammer-milled through a 0.02 rh screen. The two milled mixtures were combined and treated with 22.00 g of Pluronic.RTM. F108 (<20 mesh) in a V-blender, tumbled as the temperature of the powders were brought to 70.degree. C. with a hair dryer, cooled to 50.degree. C. and the granules collected.

Detailed Description Text (127):

A mixture of 46.48 g of "wetcake" glyphosate (11% water, 86.3% a.e.) and 32.08 g of anhydrous sodium pyrophosphate as blended in a Black and Decker Handy Chopper.RTM. mill for 10 minutes, and hammer-milled through a 0.02 rh screen. All other components except the binder, i.e., 1.11 g of 10.times.sugar, 0.56 g of Soap L.RTM. and 9.85 g of sodium carbonate, were hammer-milled through a 0.02 rh screen. The milled glyphosate/base salt mixture and milled powders were blended together for 5 minutes, combined with 19.8 g of Pluronic.RTM. F108 (<40 mesh), an ethylene oxide/propylene oxide block polymer with 80% ethylene oxide and 20%propylene oxide units, in a V-blender, tumbled as the temperature of the powders were brought to 70.degree. C. with a hair dryer, cooled to 50.degree. C. and the granules collected.

Current US Original Classification (1):

504/128

CLAIMS:

1. A process for the preparation of a dry flowable agriculturally suitable composition whose pH when measured by a 1% by weight aqueous solution of the composition is 4 or higher comprising

(a) blending 0.1-40% of an anhydrous base salt with 1-70% wetcake glyphosate to form a blended mixture I,

(b) blending the following ingredients

(1) 0-10% Of an anti-caking agent,

(2) 0-1% of an anti-foaming agent,

(3) 0.1-20% of a stabilizer selected from sodium metasilicate and sodium carbonate,

(4) 0.1-40% of a sulfonylurea herbicide to form blended mixture II,

(c) milling blended mixture II to form a powder,

(d) blending mixtures I and II with 5-30% of a heat activated binder,

(e) heating to 60.degree.-70.degree. C., and

(f) cooling to 50.degree. C. or lower wherein all of the above percentages are by weight based on the composition.

2. The process of claim 1 wherein the sulfonylurea herbicide is 0.5-20%.

3. A free flowing, non-caking, low attrition agriculturally suitable glyphosate composition comprising in weight percent based on the total composition weight

(1) 1-70% wetcake glyphosate,

(2) 2-8% water,

(3) 0.1-40% anhydrous base salt,

(4) 0-10% anti-caking agent,

(5) 0-1% anti-foaming agent,

(6) 0.1-20% stabilizer selected from sodium metasilicate and sodium carbonate,

(7) 5-30% heat activated binder, and

(8) 0.1-40% sulfonylurea herbicide provided that the pH of a 1% aqueous solution of the composition is higher than or equal to 4.

4. The composition of claim 3 wherein the wetcake is 20-60%, the anhydrous base salt is 4-30%, the anti-caking agent is 0-5%, the stabilizer is 2-15%, the heat activated binder is 10-25% and the sulfonylurea herbicide is 0.5-20%.

6. The composition of claim 3 wherein the sulfonylurea herbicide is methyl 2-[[[(4-methoxy-6-menthyl-1,3,5-triazin-2-yl) amino]carbonyl]amino]-sulfonyl]benzoate.

7. The composition of claim 3 wherein the sulfonylurea herbicide is methyl 2[[[(4,6dimethyl-2-pyrimidinyl) amino]carbonyl]amino]sulfonyl]benzoate.

8. The composition of claim 3 wherein the sulfonylurea herbicide is nicosulfuron.

9. The composition of claim 4 wherein the sulfonylurea herbicide is selected from chlorsulfuron; chlorimuron ethyl; tribenuron methyl; bensulfuron methyl; methyl 2-[[[(4,6-dimethoxy-2-pyrimidinyl)-amino]carbonyl]amino]sulfonyl]-6-(trifluoromethyl)-3pyridinecarboxylate; methyl 2-[[[[4-ethoxy-6-(methylamino)-1,3,5-triazin-2-yl]amino]carbonyl]amino]sulfonyl]benzoate; 2-(2-chloroethoxy)-N-[[[(4-methoxy-6-methyl-1,3,5-triazin-2-yl) amino]carbonyl]benzenesulfonamide; ethyl 5-[[[(4,6-dimethoxy-2-pyrimidinyl) amino]-carbonyl]amino]sulfonyl]-1-methyl-1H-pyrazole-4-carboxylate; N-[[[(4,6-dimethoxy-2-pyrimidinylamino)-carbonyl]-3-(ethylsulfonyl)-2-pyridinesulfonamide; N-[[[(4,6-dimethoxy-2-pyrimidinyl) amino]carbonyl]-1-methyl-4-(2-methyl-2H-tetrazol-5-yl)-1H-pyrazole-5sulfonamide; and methyl 2-[[[[4-(dimethylamino)-6-(2,2,2-trifluoroethoxy)-1,3,5-triazin-2-yl]amino]-carbonyl]amino]sulfonyl]-3-methylbenzoate.

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L19: Entry 25 of 29

File: USPT

Aug 15, 1995

DOCUMENT-IDENTIFIER: US 5441923 A

TITLE: Water-soluble or water dispersible pesticide granules comprising sulfonylurea herbicides in a polyethylene or polypropylene coatingAbstract Text (1):

Water-soluble or water-dispersible granular compositions prepared by coating a water-soluble sulfonylurea herbicide or a water-soluble or water-dispersible form of a sulfonylurea herbicide on a granular substrate using a water-soluble polyethylene glycol binder, and a method for controlling undesired vegetation.

Brief Summary Text (2):

Sulfonylurea herbicides have proven to be particularly effective herbicides and are in worldwide use. Sulfonylureas are water-sensitive and compositions comprising sulfonylureas can be decomposed in storage by even low residual levels of moisture.

Brief Summary Text (5):

Often it is desirable to use mixtures of two or more pesticides of different functions to provide broad spectrum control over a variety of weeds and/or undesirable organisms, for example a mixture of a herbicide and an insecticide. Unfortunately, some of the individual components are physically or chemically incompatible as mixtures, especially in long-term storage. For example, carbamate insecticides are generally unstable in the presence of alkaline components and sulfonylurea herbicides are known to be unstable in the presence of acidic materials as well as moisture. The chemical incompatibility can be due to an impurity present in the complementary pesticide and not the bioactive component itself. For these reasons it would be desirable to have a sprayable, formulated product consisting of particles or granules wherein the active components are physically separated. Canadian Patent No. 589,926 describes herbicides bonded to a core of prilled fertilizers or inert materials by a water-soluble binder. However, these compositions employ and retain high levels of water and are intended for use in dry form by direct application.

Brief Summary Text (8):

(a) 0.1 to 50% of a water-soluble or water-dispersible sulfonylurea herbicide; and

Brief Summary Text (14):

(c) contacting the coated substrate while the coating is in a molten state with a water-soluble or water-dispersible sulfonylurea herbicide; and

Brief Summary Text (18):

Many pesticides have been formulated to dry flowable granular compositions suitable for coating by the process of this invention. They include herbicidal sulfonamides, phenylether herbicides, glyphosate, metribuzin, bromacil, diuron, hexazinone, manzate, flusizol, oxamyl and hexythiazox. Pesticide (active ingredient) means herbicides, fungicides, insecticides, nematocides, miticides, virucides, algicides, bactericides, plant growth regulants, defoliants, insect attractants and repellents and particularly compatible combinations of the foregoing. A water-soluble pesticide refers to compounds which are substantially dissolved in water under the conditions of temperature and concentration at which application (e.g., spraying of the solution) is to be carried out. A water-dispersible form of a pesticide refers to the various agriculturally suitable formulations including wettable powders used in coatings and dry flowables used as granular substrates. Preferred are herbicides

selected from the class of herbicidal sulfonylureas, nonlimiting examples of which include the following. Each of these may be water-soluble or formulated in a water-dispersible or water-soluble form:

Brief Summary Text (33):

ethyl 5-[3-(4,6-dimethoxypyrimidin-2-yl)ureidosulfonyl]-1-methylpyrazole-4-carboxylate

Brief Summary Text (39):

Specifically preferred as coating sulfonylurea herbicides are:

Brief Summary Text (45):

and their agriculturally suitable salts, and water-dispersible powder formulations of the foregoing. The term "sulfonylurea(s)" as employed in this disclosure include(s) the sulfonylurea, its agriculturally suitable salts, and water-dispersible powder formulations of the foregoing.

Brief Summary Text (46):

Most preferred coating sulfonylurea herbicides are the lithium and sodium salts of 2-[[N-(4-methoxy-6-methyl-1,3,5-triazin-2-yl)-N-methylaminocarbonyl]aminosulfonyl]benzoic acid, methyl ester.

Brief Summary Text (48):

Preferred is a granular composition wherein the coating sulfonylurea herbicide(s) is (are) embedded in the carrier and the coating sulfonylurea herbicide(s) consist(s) of from 0.5 to 40% of the total weight; the polyethylene glycol, polypropylene glycol, or derivative thereof consists of from 3 to 15% of the total weight, and the substrate consists of 45 to 96.5% of the total weight.

Brief Summary Text (49):

A wide range of materials can be utilized as the granular supporting substrate including prills (e.g., urea, ammonium nitrate), crystals (e.g., sugars) or even water-soluble or water-dispersible granular formulations of other pesticides (e.g., herbicidal sulfonamides, herbicidal phenyl ethers, and herbicidal phosphonomethyl glycine derivatives) or fertilizer. Those materials that are not water-soluble can be used as substrates in granular form or as dry flowables. Specifically preferred granular substrates are potassium carbonate, urea prills, granules of:

Brief Summary Text (53):

glyphosate,

Brief Summary Text (60):

The low cost, water-soluble or water-dispersible granular compositions of the present invention are prepared by the layering or coating of a water-soluble sulfonylurea herbicide or preformulated water-dispersible form of a sulfonylurea herbicide onto a granular substrate, itself water-soluble or water-dispersible, using a water-soluble polyethylene glycol as a binder. Preparation of these formulations involves the use of simple mixing techniques and equipment in contrast to the specialized techniques and equipment required for fluidized bed and pan granulation procedures. Even mild agitation allows for the formation of the unagglomerated coated granules of the present invention. The use of simple mixing also allows for the easy incorporation of formulation adjuvants and stabilizers. Preferred among the many known preparation means are mechanical blenders.

Brief Summary Text (61):

In one embodiment, the granular substrate is mixed with the solid polyethylene glycol, or derivative binder and heated to 60.degree.-125.degree. C., preferably 70.degree.-90.degree. C., with constant agitation, until the substrate is coated. "Coated" as used herein means that at least a portion of the substrate is covered. Preferably, the substrate is completely covered. The sulfonylurea herbicide or a mixture of sulfonylurea herbicides in finely divided form is then added to the hot substrate and the blend is slowly cooled to room temperature, all under constant agitation. If a second layer is to be added, additional binder can be added prior to cooling followed by additional sulfonylurea herbicide. Alternatively, the cooled composition can be reheated and a second coating applied as previously described.

Brief Summary Text (62):

If the substrate is a bioactive material or formulated bioactive material, coating of the surface with binder and a sulfonylurea herbicide produces a layered granular product in which the active compounds are physically separated.

Brief Summary Text (63):

Alternatively, a sulfonylurea herbicide or mixture of sulfonylurea herbicides can be preblended with the molten binder and the substrate can be added last.

Current US Cross Reference Classification (1):

504/128

CLAIMS:

1. A water-soluble or water-dispersible, aqueous-sprayable pesticidal granular composition comprising at least one layer coating a substrate, said layer comprising:

(a) 0.1 to 50% of a water-soluble or water-dispersible sulfonylurea herbicide; and

(b) 1 to 20% of a solid carrier selected from the class consisting of a water-soluble polyethylene glycol, polypropylene glycol or ester or ether derivative thereof, or a copolymer or mixture thereof having a weight average molecular weight in the range 3000-8000; and the substrate comprising 50 to 98.9% of a water-soluble or water-dispersible granule of a diameter of at least about 500 microns; said foregoing percentages based by weight on the total weight of the layer and the substrate, respectively.

2. The granular composition of claim 1 wherein the sulfonylurea is embedded in the carrier.

3. The composition of claim 1 wherein the percentages of the sulfonylurea, the carrier and the substrate are 0.5 to 40%, 3 to 15% and 45 to 96.5%, respectively.

4. The composition of claim 3 wherein the carrier is polyethylene glycol and the sulfonylurea is a member selected from the class consisting of:

2-[[N-(4-methoxy-6-methyl-1,3,5-triazin-2-yl)-N-methylamino]carbonyl]-amin o
[sulfonyl]benzoic acid, methyl ester,

3-[[[(4-methoxy-6-methyl-1,3,5-triazin-2-yl)amino]carbonyl]amino]sulfonyl]
-2-thiophene carboxylic acid, methyl ester,

methyl 2-[[[(4,6-dimethoxy-2-pyrimidinyl)amino]carbonyl]amino]sulfonyl]methyl-be
nzoate

methyl-2-[[[(4-methoxy-6-methyl-
1,3,5-triazin-2-yl)amino]carbonyl]amino]sulfonyl]-benzoate,

2-chloro-N-[(4-methoxy-6-methyl-1,3,5-triazin-1-yl)amino]carbonyl)
benzenesulfonamide, and

agriculturally suitable salts and water-dispersible formulations of the foregoing.

6. The composition of claim 1 wherein the composition comprises multiple layers of carrier embedded with incompatible sulfonylurea herbicides.

WEST**End of Result Set**

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L19: Entry 29 of 29

File: USPT

Dec 10, 1991

DOCUMENT-IDENTIFIER: US 5071464 A

TITLE: Herbicidal agents

Abstract Text (1):

Combinations of herbicides of the formula I ##STR1## in which R denotes H or (substituted)alkyl, or salts thereof, together with herbicides of the Phosphinothricin type or together with herbicides of the Glyphosate type or together with (substituted) phenoxy-carboxylic acids or together with herbicidal urea compounds or together with herbicidal triazine or together with certain herbicidal sulfonyl ureas or together with a compound of the formula VIII ##STR2## or salts thereof, possess surprising synergistic properties and can be employed advantageously for the control of weeds in crops of useful plants or on areas used for industry.

Brief Summary Text (7):

The compound of the formula III is known by the name Glyphosate. It can exist in the form of its salts, the isopropylammonium salt (compound IIIa) being particularly important. Further examples of suitable salts are metal salts, such as alkali and alkaline earth metal salts, optionally substituted phosphonium or ammonium salts, and sulphonium or sulfoxonium salts, for example trialkylsulfoxonium salts such as, in particular, the trimethylsulfoxonium salt. Esters which are of interest are, in particular, (C.sub.1 -C.sub.4)-alkyl esters. Suitable substituents for ammonium and phosphonium are the radicals mentioned for the compounds of the formula I.

Current US Original Classification (1):504/128